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Christophe Boyer

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EXAMINER

LEUNG, JENNIFER A

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,152

Applicant(s)

BOYER ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 12-23 is/are pending in the application.
- 4a) Of the above claim(s) 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 12-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1,2 and 12-23 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08-16-2001.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1, 2 and 12-22, in the reply filed on October 27, 2004 is acknowledged. The traversal is on the ground(s) that,

“... it is submitted that a complete search of the device and reactor 422, subclass 194, will also necessitate a search of processes contained in claims 208, subclasses 209, 264 or 254H. In such a situation where there is little, if any, additional effort upon the PTO to search the entirety of an invention, the M.P.E.P. mandates that such examination be made.”

This is not found persuasive for the same reasons set forth in the initial restriction requirement.

As stated before, the apparatus as claimed can be used to practice another and materially different process. This is further illustrated by Forster et al. (US 3,895,919 or US 3,946,104), which clearly evidences the use of the claimed apparatus for another and materially different process than hydrodesulfurization, selective hydrogenation, or hydro-denitrogenation reactions.

The requirement is still deemed proper and is therefore made FINAL.

2. Claim 23 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Drawings

3. The drawings are objected to because:

“Figure n°1” should be changed to -- Figure 1 --.

“Figure n°2” should be changed to -- Figure 2 --.

“ou” in FIG. 1 and FIG. 2 should be changed to -- or --.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because FIG. 2 includes the reference characters **5** and **12** which are not mentioned in the description.

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5. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 13, 14, 16 and 19-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 13 and 14, "the liquid" (line 4) and "the liquid fraction" (line 5) lack proper positive antecedent basis.

Regarding claim 16, it is unclear as to the structure applicant is attempting to recite because the additional features as recited in claim 16 are found in a different embodiment than the embodiment as set forth in claim 13, and it does not appear that the two embodiments are capable of coexisting as a single embodiment. For instance, a first contact and distribution means (200) comprising plate-covered conduits (206) is presented in the embodiment of Figure

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3, whereas a second contact and distribution means (220) comprising conduits (222) and tubes or mixer channels (224) is presented in the embodiment of Figure 4.

Regarding claim 19, it is unclear as to the relationship between the “upper granular bed” in lines 3-9 and the “at least one upper bed of granular solids” as set forth in line 2. Furthermore, it is unclear as to the relationship between the “at least one bed of granular solids located downstream of said means,” (line 10) and “the lower granular bed” set forth in lines 3-9.

Regarding claim 21, it is unclear as to the structural limitation applicant is attempting to recite because it is unclear as to what is intended by the term “co-current dropper mode” and where it is disclosed in the specification and drawings.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Forster et al. (US 3,895,919). [Equivalent disclosure to US 3,946,104 of International Search].

Regarding claim 1, Forster et al. (FIG. 1; column 3, line 4 to column 4, line 25) discloses a device comprising: a chamber for injecting a secondary fluid (i.e., a chamber as defined between the upper and lower tube plates 8, for injecting a quench gas 11); means (i.e., via the upper portion of tubes 9) for bringing the secondary fluid 11 and at least a portion of fluid or mixture of fluids originating from an upper granular bed (i.e., the “reaction stream” from catalyst layer 1, collected in equalizing space 2) into contact; and means (i.e., via the lower portion of

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tubes 9) for simultaneous distribution of the mixture resulting from the contact to a lower granular bed (i.e., into a distribution space 2 and subsequently to a downstream catalyst layer 6).

Regarding claim 2, the secondary fluid is not considered an element of the apparatus and therefore the device of Forster et al. structurally meets the claims. In any event, the device would inherently be capable of utilizing a gas phase, such as hydrogen gas, for the secondary fluid, as evidenced by the device being used for supplying a quench 11 of the gas phase.

Regarding claim 12, Forster et al. (FIG. 1; column 3, line 53 to column 4, line 25) discloses the contact and distribution means are conduits (i.e., a plurality of tubes 9) with a substantially constant diameter along their axial length traversing the chamber and pierced with orifices (i.e., a plurality of openings 10) over their lateral wall.

Regarding claim 17, Forster et al. discloses the contact and distribution means (i.e., tubes 9) extend below the chamber by a given distance (see FIG. 1, wherein the bottom of tubes 9 extend a distance below the lower tube plate 8).

Instant claims 1, 2, 12 and 17 structurally read on the apparatus of Forster et al.

8. Claims 1, 2, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Framo (EP 0 674 249).

Regarding claim 1, Framo (FIG. 1; page 2, line 50 to page 3, line 8) discloses a device comprising a chamber (defined by container 10) for injecting a secondary fluid (a liquid or gas in pipe 12), and means for bringing the secondary fluid and a primary fluid supplied from above into contact and for simultaneous distribution of the mixture resulting from the contact to below (via blending of a liquid supplied by inlet duct 14 with the liquid or gas within the perforated portion of pipe 12, and subsequent distribution of the mixture by the lower portion of pipe 12).

Regarding claim 2, the secondary fluid is not considered an element of the apparatus and therefore the device of Framo structurally meets the claims. In any event, the device would inherently be capable of utilizing a hydrogen gas for the secondary fluid, as evidenced by the supply of a gas phase via central pipe **12** (page 2, line 57 to page 3, line 5).

Regarding claim 12, Framo (FIG. 1) discloses the contact and distribution means comprises a conduit (i.e., pipe **12**) with a substantially constant diameter traversing the chamber **10**, pierced with orifices (i.e., perforations **22**) over its lateral wall.

Regarding claim 17, Framo discloses the contact and distribution means (i.e., pipe **12**) extends below the chamber **10** by a given distance (see FIG. 1).

Instant claims 1, 2, 12 and 17 structurally read on the apparatus of Framo.

9. Claims 1, 2 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Callebert et al. (US 5,755,960). [Equivalent to FR 2 740 054 of International Search].

Regarding claim 1, Callebert et al. (FIG. 1, 2; column 9, line 18 to column 11, 30) discloses a device comprising a chamber for injecting a secondary fluid (i.e., injection/removal chambers **5,6** for injecting a secondary fluid **B1,B2**), and means (i.e., mix chamber **7**) for bringing the secondary fluid **B1, B2** and at least a portion of fluid or mixture of fluids (i.e., main fluid **A1**) from an upper granular bed (i.e., bed of granular solids **2**) into contact, via perforations **15**, and for simultaneous distribution of the mixture resulting from the contact to a lower granular bed (i.e., bed of granular solids **10**), via perforations **17**.

Regarding claim 2, although Callebert et al. is silent as to the secondary fluid comprising a gaseous phase such as hydrogen, the apparatus structurally meets the claims since the secondary fluid is not considered an element of the apparatus.

Regarding claims 19 and 20, Callebert et al. (FIG. 1, 2; column 9, line 18 to column 11, 30) discloses an apparatus comprising: at least one upper bed of granular solids **2**; at least one a device comprising a chamber for injecting a secondary fluid (i.e., injection/removal chambers **5,6** for injecting a secondary fluid **B1,B2**), and means (i.e., mix chamber **7**) for bringing the secondary fluid **B1, B2** and at least a portion of fluid or mixture of fluids (i.e., main fluid **A1**) from an upper granular bed (i.e., bed of granular solids **2**) into contact, via perforations **15**, and for simultaneous distribution of the mixture resulting from the contact to a lower granular bed (i.e., bed of granular solids **10**), via perforations **17**; at least one lower bed of granular solids **10** downstream of said means; and at least one separate line (i.e., conduit **12, 13**) for injecting secondary fluid into the chamber **5,6**, said separate line **12, 13** being substantially perpendicular with respect to the axis of the apparatus **1** (see Figures).

Regarding claim 21, as best understood, Callebert et al. discloses means for circulating liquid and gas phases through granular beds **2, 10** in co-current dropper mode (as evidenced by the co-current, downflow of the fluids through the beds; see FIG. 1).

Instant claims 1, 2 and 19-21 structurally read on the apparatus of Callebert et al.

10. Claims 1, 2, 12 and 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Lodeng (WO 96/19424). [Equivalent to US 5,997,826 of International Search].

Regarding claim 1, Lodeng (FIG. 1-5; page 6, lines 8-35) discloses a device comprising a chamber (i.e., oxygen admixing zone **3**) for injecting a secondary fluid (i.e., oxygen supplied by inlet **8**) and means (i.e., means **5**, designed as a tube having orifices **6**) for bringing the secondary fluid and at least a portion of fluid or mixture of fluids from an upper granular bed (i.e., catalyst zone **2**) into contact and for simultaneous distribution of the mixture resulting from the contact to

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a lower granular bed (i.e., catalyst zone 4).

Regarding claim 2, although Lodeng supplies a gas phase comprising oxygen via inlet 8 as opposed to hydrogen, the apparatus structurally meets the claims, as the secondary fluid is not considered an element of the apparatus.

Regarding claim 12, Lodeng discloses the contact and distribution means are conduits (i.e., tubes 5) with a substantially constant diameter, traversing the injection chamber 3 and pieced with orifices 6 along their lateral wall (see Figures).

Regarding claims 19, 20 and 22, Lodeng (FIG. 1-5; page 6, line 8 to page 8, line 8) discloses a reactor comprising: at least one upper bed of granular solids (catalyst zone 2/7); at least one device comprising a chamber (oxygen admixing zone 3) for injecting a secondary fluid (oxygen supplied by inlet 8) and means (tubes 5 having orifices 6) for bringing the secondary fluid and fluids from an upper granular bed 2 into contact and for simultaneous distribution of the mixture resulting from the contact to a lower granular bed (catalyst zone 4); at least one bed of granular solids located downstream of said means (catalyst zone 4/7); and at least one separate line (inlet 8) for injecting the secondary fluid into the chamber, said line 8 being substantially perpendicular to the axis of the reactor 1 (see FIG. 1, 3, 5).

Regarding claim 21, as best understood, Lodeng discloses the apparatus being of co-current dropper mode (evidenced by the co-current downflow through beds 2, 4; see figures).

Instant claims 1, 2, 12 and 19-22 structurally read on the apparatus of Lodeng.

11. Claims 1, 2, 13, 15, 17, 19, 20 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Pappas et al. (US 3,091,586).

Regarding claims 1 and 2, Pappas et al. (see Figure) discloses a device comprising:

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a chamber for injecting a secondary fluid (i.e., an H₂ treat gas receiving compartment, defined between plates 7 and 12, or between plates 8 and 13; column 2, lines 8-19); means for bringing the secondary fluid and at least a portion of fluid or mixture of fluids originating from an upper granular bed into contact (i.e., via distribution of upflowing gas through risers 40, bubble caps 10 and into the liquid resting on the bubble cap plates 7 or 8; column 2, lines 1-7; column 3, line 72 to column 4, line 8); and means for simultaneous distribution of the mixture resulting from the contact to a lower granular bed (i.e., via liquid downflow pipes 11).

Regarding claim 13, Pappas et al. (Figure) discloses conduits (i.e., riser tubes 40) having a height greater than the maximum height reached by liquid on plate 7 or 8, the upper portions the conduits 40 being provided with a plate (i.e., bubble caps 10) preventing flow of the liquid fraction of the fluid or fluid mixture originating from the upper granular bed through said conduits (column 3, line 72 to column 4, line 8).

Regarding claim 15, Pappas (column 2, lines 1-19) discloses said contact and distribution means comprise conduits allowing passage of the secondary fluid into a zone located above said chamber defined between plates 7 and 12, or between plates 8 and 13 (i.e., via upward flow through riser tubes 40); and tubes or mixer channels with a substantially constant diameter along their axial length traversing the chamber in a fluid tight manner (i.e., via liquid downflow pipes 11), the upper portions of which are provided with orifices (i.e., the upper openings to tubes 11).

Regarding claim 17, Pappas et al. discloses the contact and distribution means extend below the chamber by a given distance (see Figure, wherein the lower end of pipes 11 each extend below plates 12, 13).

Regarding claims 19, 20 and 22, Pappas et al. (Figure) discloses a fixed bed reactor (i.e.,

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tower T) comprising: at least one upper bed of granular solids (i.e., catalyst bed 18); at least one device for injecting a secondary fluid located between two successive upper and lower granular beds (i.e., between beds 18 and 22), said device comprising a chamber for injecting a secondary fluid (i.e., an H₂ treat gas receiving compartment, defined between plates 7 and 12; column 2, lines 8-19), means for bringing the secondary fluid and at least a portion of fluid or mixture of fluids originating from the upper granular bed into contact (i.e., via distribution of upflowing gas through bubble caps 10 and into the liquid resting on the bubble cap plates 7 or 8; column 2, lines 1-7; column 3, line 72 to column 4, line 8), and means for simultaneous distribution of the mixture resulting from said contact to the lower granular bed located downstream of said fluids (i.e., via downflow pipes 11); at least one bed of granular solids downstream of said means (i.e., catalyst bed 22); and at least one separate line for injecting secondary fluid into the chamber of said means, said separate line being substantially perpendicular with respect to the axis of the reactor (i.e., perpendicular hydrogen feed line 14).

Instant claims 1, 2, 13, 15, 17, 19, 20 and 22 structurally read on the apparatus of Pappas.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pappas et al. (US 3,091,586).

Pappas et al. discloses that a distance (see Figure) is provided between the bottom end of the tubes or mixer channels **11** and the upper surface of the lower bed (i.e., the upper surfaces of beds **22** or **23**), and that a plurality of tubes or mixer channels **11** is provided for each plate **12**, **13**. However, Pappas et al. is silent as to the distance between the bottom end of tubes **11** and the upper surface of the lower beds **22**, **23** being specifically 0 to 50 mm, with 0 excluded. Pappas et al. is further silent as to the density of conduits **11** being more than 80 per square meter. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select the recited distance and the recited density for the conduits **11** in the apparatus of Pappas et al., on the basis of suitability for the intended use and absent showing any unexpected results thereof, because changes in size merely involves ordinary skill in the art, the duplication of parts merely involves ordinary skill in the art, and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

13. Claim 14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


Shirtum (US 6,017,022), as cited in the International Search Report, was considered but was not relied upon in the rejections, due to the similarities of the disclosed structure with the structure of Framo as commented above.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
January 5, 2005 


**HIEN TRAN
PRIMARY EXAMINER**